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Electoral cycles in Ukraine

Abstract

This empirical research aims to test for the presence of opportunistic electoral business cycles in Ukraine. National and regional-level data on budget revenues and expenditures, output, unemployment rate, wages, and wage arrears (and prices, subject to the availability of data) will be employed. We will try to evaluate the magnitudes of electoral cycles, and check whether magnitude decreases with rationality of voters.

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ELECTORAL CYCLES IN UKRAINE*

Sergiy Verstyuk†

Abstract

This paper tests for the presence and magnitudes of political business cycles in Ukraine using 1996-2002 data on behavior of economic activity indicators and 1998-2001 panel on fiscal policy measures in 27 regions. Relatively strong evidence of electoral cycle in regional budgetary policy is found.

JEL codes: D82, L33, P23
Keywords: political business cycles, opportunistic cycles

1 Introduction

There are several convincing economic models providing theoretical foundations for opportunistic business cycles, i.e. business cycles produced by office-seeking policy-makers intending to win elections, with an upturn right before elections. Ability to trade-off short-run benefits for long-run costs or asymmetric information of politicians and voters can explain such behavior. Empirical evidences, especially those from developing countries, tend to support opportunistic cycles hypothesis.

Several reasons suggest the existence of opportunistic business cycles in Ukraine. Ukrainian anecdotal evidences and media argue for a rapid liquidation of wage arrears, increase in social welfare transfers, establishment of price controls etc. in pre-election period. A recent empirical study for Russia (Akhmedov and Zhuravskaya, 2003) finds

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strong support for opportunistic cycles theory there. Ukrainian institutional framework, which is quite similar to Russian, is likely to give same results. No such studies for Ukraine were conducted so far.

The aim of this empirical research is to test for the presence of opportunistic electoral business cycles in Ukraine. National-level data on economic activity indicators and regional-level data on economic policy measures (budget data) are used. We also try to evaluate the magnitudes of cycles, and check whether magnitude decreases with sophistication of voters.

2 Literature review

There is a number of stylized empirical facts observed that propose the existence of opportunistic business cycle (Persson and Tabellini, 2000). For instance, inflation increases shortly after elections; budget deficits tend to be larger during election years; there is also some (not very strong) evidence that monetary policy is more expansionary before elections. On the other hand, real variables, such as growth or unemployment, are not systematically correlated with elections dates.

Political business cycles [PBC] is one of the most studied areas within the field of Political Economics, being granted separate chapters in core Political Economics textbooks by Persson and Tabellini (2000) and Drazen (2000a). A separate fundamental book by Alesina et al. (1997) has already been published.

The literature on PBC is enormous now, and its survey is a task that deserves a separate paper. Obviously, this job was fulfilled by many authors, and besides above–mentioned Political Economics textbooks and Alesina et al. (1997) book, it has also been done in Price (1997), Gartner (1994), Hibbs (1992), Nordhaus (1989) etc. Empirical tests of PBC are very much emphasized in Alesina et al. (1997), they are also reviewed in Drazen (2000a). Excellent brief summary of empirical works is given in Block and Vaaler (2001).

In this paper we plan to concentrate on opportunistic (on the contrast to partisan) business cycles exclusively. Opportunistic business cycles [OC] are created as a result of opportunistic office–motivated behavior of politicians. Originally, Nordhaus (1975) claimed that the incumbent government adopts expansionary policy ahead of the elections, reaping short–run benefits before, and postponing long–run costs till the time after the elections.

Although the first wave of PBC researches was started in 1970–s, they did not digest a rational expectations revolution in macroeconomics, and relied on the irrational backward–looking behavior of voters. Specifically, they assumed a Phillips curve relation between inflation and output (or

unemployment), with adaptive expectations of voters. The interest to PBC reappeared in the late 1980–s. Second wave of PBC papers accepted rational behavior of voters, incorporating rational expectations in their framework. The most important papers were those by Rogoff and Sibert (1988), and Rogoff (1990), which concentrated on rational opportunistic cycles based on asymmetric information about government's competence.

The PBC literature is mushrooming since the 1990–s, and many interesting works appeared at this time. We will shortly mention those, which influence this research most significantly. Drazen (2000b and 2001) constructed so called "active fiscal–passive monetary" model of rational OC, in which monetary policy of CB accommodates government's manipulation of fiscal policy. In explicitly dynamic context, Asteriou et al. (2000) incorporated OC into general equilibrium endogenous growth model. Shi and Svensson (2001) used a large panel data set to test rational OC.

It is generally recognized that PBC are indeed observed in the data. For OC, more so in the behavior of policy instruments than in the behavior of measures of economic activity. More in fiscal rather than in monetary policy (which is naturally less politically biased). Also, OC are more pronounced in developing economies.

An important contribution to the OC literature was made by Treisman and Gimpelson (2001). This paper argues that incumbent has a full menu of instruments to manipulate the economy, and chooses between alternatives depending on their relative costs and benefits. Naturally, at different elections and at different points of time incumbent may choose a unique set of instruments. Thus, exhaustive tests for OC should consider the full range of possible manipulations, because focusing on one indicator only may incorrectly reject the OC hypothesis. Such an approach allows Treisman and Gimpelson to find significantly stronger evidence for the presence of OC in the Russian data.

Hallerberg and de Souza (2000) studies political business cycles in Eastern European EU accession countries controlling for exchange rate regimes and central bank independence. They find that countries with flexible exchange rate regime and dependent central bank.increase monetary supply, while countries with fixed exchange rate engage in fiscal expansions during electoral periods.

Now we will touch in more details a recent empirical paper on PBC in Russia. Akhmedov and Zhuravskaya (2003) tests for the presence of opportunistic and partisan political business cycles in Russian regions. It uses a monthly panel data for 1996-2002 in 86 Russian regions, and finds strong evidences of opportunistic political cycles.

Total budgetary expenditures, expenditures on education, health-

care, social disbursements, industrial subsidies, and mass media start growing about nine months before elections (with a significant jump up), rise gradually for eight months after that, and then exhibit the largest increase one month before elections. Total spending and spending on education, culture, and mass media drop sharply right after the elections, other spending items decline more gradually. Wage arrears (especially in public sector) decrease throughout the year prior to elections with an increasing pace and gradually accumulate during the first quarter after the elections. Revenues rise a month before elections mostly due to increases in federal transfers and fall sharply during two months after elections due to decline in transfers and tax revenues. Additional pre-electoral expenditures are financed partly with budget deficit, partly with transfers, and partly with surplus accumulated approximately a year prior to elections when social expenditures and subsidies are below and wage arrears above their natural levels. Incumbent governors pursue expansionary policy and try not to overburden enterprises with higher taxation. The cycles in social expenditures, regional wage arrears (which primarily target poor) as well as media expenditures appear to have the largest amplitude, they are the most important instruments of pre-electoral manipulations. An increase in populist spending prior to elections leads to above average inflationary pressure. Governors, however, try to confine inflation by administrative price controls during few months before elections, so prices rise after elections. Wage level and money income rise significantly before elections; wages fall a quarter after elections. Industrial output follows a particular cyclical pattern: it falls half a year before elections, then stabilizes until elections and falls again after elections. These fluctuations do not result in significant changes in regional growth rates. It is the poorest cohort of voters that is targeted by cyclical policies. Magnitude of opportunistic cycles decreases with voters' rationality and awareness.

The last relevant to our work paper is Mau et al. (2001), which conducted a thorough analysis of the economic factors of electoral behavior in Russian regions for 1995-2000 federal elections. It found that economic indicators have significant impact on voting decisions, and especially stresses the importance of wage arrears, payables and receivables. Thus, the authors make a conclusion about rationality of Russian voters. However, they argue that temporal expansion of budget expenditures does not significantly modify voters' opinion.

3 Conceptual framework

3.1 Theoretical background

Formal model of rational opportunistic cycles was developed in Rogoff (1990). The general idea of Rogoff's political budget cycles model is based on asymmetric information: rational voters do not know rivaling policy-makers' competence. And more able incumbent distorts government's (fiscal) policy to signal its higher competence. The first best solution would be to find a less distorting signal. For example, accumulation, analysis and dissemination of information about policy-makers performance (e.g. through mass-media) will let voters make some inferences about incumbent and opposition politicians' competence. Also, legal restrictions on distorting behavior may increase social welfare (they might decrease welfare as well, if even more distorting policy will be pursued instead, or competence will not be revealed at all). Finally, allowing for option of calling for an early election will provide an additional opportunity for signaling.

If rationality of voters does not hold, then traditional Nordhaus' opportunistic business cycles' theory applies. Incumbent (irrespective of his competence) will cheat naive and myopic voters: adopt expansionary policy ahead of the elections, reaping short-run benefits before, and postponing long-run costs till the time after the elections. For example, this can be done in a world with Phillips curve inflation-unemployment trade-off and adaptive expectations of voters. In this case, education and informing of voters, and legal restrictions on opportunistic behavior will be the best solutions.

Depending on institutional arrangement, opportunistic cycles can be exhibited in some policy instruments (with the possibility of switching between them with time), but absent in other. Also, they may or may not finally influence measures of real economic activity.

3.2 Hypotheses

Hence, our hypotheses are as follows:

Hypothesis A. *Governmental policy and behavior of measures of economic activity exhibit electoral cycle.*

Hypothesis B. *Magnitude of electoral cycles in governmental policy and behavior of measures of economic activity decreases with the rise of voters' sophistication and available information.*

We expect that both hypotheses will find support. Unfortunately, this would not allow us to disciminate betwen rational and traditional theories of electoral cycles, because (i) it is not practically possible to separate proxies for voters' sophistication from those for information

Table 1: Ukrainian budget system

BUDGET LEVEL	APPROVED BY	SIGNED BY	EXECUTED BY (DECISIVE)
State budget	Parliament	President	Cabinet of Ministers
Regional (oblast) budget	Regional council	Head of regional state administration	Regional state administration

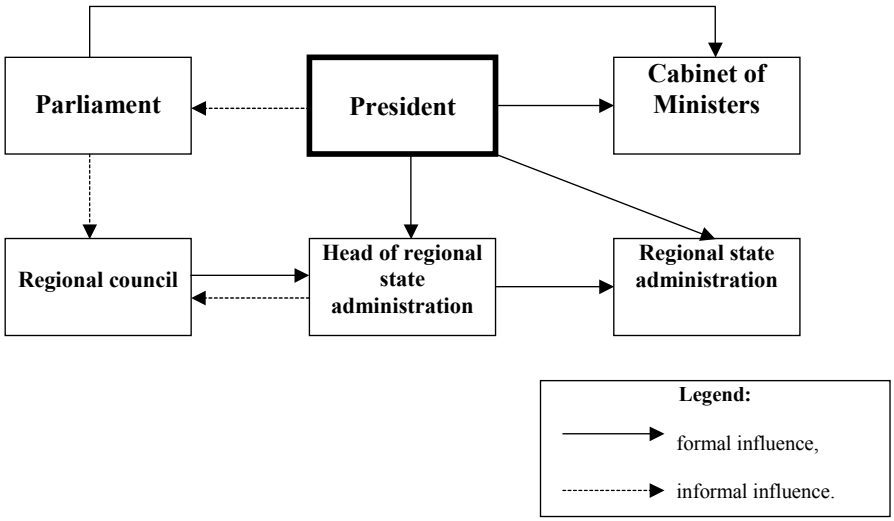
symmetry, and (ii) both of them predict similar relationship between the magnitude of cycles and above-mentioned proxies. However, since rejection of Hypothesis B also disproves the rational PBC theory, it would be reasonable in this case to recommend restricting the distorting opportunistic behavior of policy-makers, because no useful information about competence is revealed then. On the other hand, acceptance of Hypothesis B does not reject neither rational nor traditional PBC theories, thereby confirming the existence of problems with voter's sophstication and/or information asymmetry. In such a case, policy targeted at solving these two problems would be desirable.

3.3 Ukrainian political system

There are two layers in Ukrainian budget system: national level (State budget) and local level (oblast, rayon/city, town/cities' rayon, and village). On the local level, we will deal with 27 oblast ("region" from now on) level budgets exclusively. Budgets are approved by councils — Ukrainian parliament "Verkhovna Rada" for State budget, and regional councils for regional budgets, and signed by President for State budget, and heads of regional administrations for regional budgets. However, they are executed by executive power – Cabinet of Ministers for State budget and regional state administrations for regional budgets, who have decisive power with respect to short-term fiscal policy decisions. Hence, executive power (President, Cabinet of Ministers, and regional state administrations) has higher influence on fiscal policy than councils do (especially on short-term decisions). Similar scheme with the dominance of executive authorities works for the whole system of economic policy in Ukraine.[1]

[1]For example, temporary price restrictions can be set by regional executive authorities.

Figure 1: Ukrainian political system



At the same time, executive power is dominated by the President of Ukraine. President defines general principles of governmental policy in Ukraine. Also, in addition to (formal) rights of making appointments to/dismissing from executive offices, he/she has strong (albeit informal) influence on legislative power.

As a result, economic policy in Ukraine to a large extent is defined by the President. Consequently, political actors are split between pro-Presidential parties and parties that are alternative to them. This pattern replicates on presidential and parliamentary elections. That is why from now on, we define incumbent as pro-Presidential parties (so called "party-in-power"), and opposition as alternative to pro-Presidential parties.[2]

Ukrainian political system implies elections to the Parliament of Ukraine every 4 years, Presidential elections every 5 years, and elections to local councils every 4 years, as well as elections of cities, towns, and village mayors every 4 years. Presidential elections are organized according to two-stages relative majority scheme: on the first round, two candidates with relative majority of collected votes qualify; on the second, candidate that received more votes wins. One half of the members of Parliament (225 persons) and all members of local councils are elected under a one-stage relative majority system. Second half of the

[2]Certainly, this distinction is not always unambiguous. However, it is a conventional one, even for transitional countries. For example, Mau et al. (2001) also use a "bipolar" prospective for Russian experience.

Table 2: Recent elections in Ukraine

DATE	ELECTIONS	INCUMBENT
March 1998	Parliamentary and local councils elections	National-Democratic Party, Agrarian Party of Ukraine
October 1999	Presidential election	Leonid Kuchma
March 2002	Parliamentary and local councils elections	"For United Ukraine" Bloc, Social-Democratic Party of Ukraine (united)

members of Parliament is elected under a proportional system with a 4% threshold: parties' lists that gained more than 4% of votes share 225 seats proportionally to the number of votes collected, and they represent country as a whole, rather than specific districts.

And the basic logic of elections process in Ukraine is as follows: incumbent cares about its candidate(s) trying to influence elections' outcome through its representatives in public authorities (both national and local, legislative and executive), utilizing the fact that any improvements are ascribed to the incumbent ("party-in-power") candidate(s).

The mechanism of Presidential elections is straightforward then. Matters are more complicated for Parliamentary and local councils elections, since they involve voting for both parties' lists and single candidates.

The very existence of voting for parties' lists (which are the same in every district) makes incumbent to favor pro-Presidential parties in every region of Ukraine, including creation of political cycles in regional budgets (as well as in other policy instruments). For example, in 1998 central government and regional state administrations influenced by the President were interested in creating cycles in State and regional budgets to favor NDP and APU parties' lists.

Voting for single candidates to the Parliament somehow blurs this effect. The same considerations as above (i.e. securing pro-Presidential majority in the Parliament) pushed central government and regional state administrations to create cycles in order to favor single candidates to the Parliament from pro-Presidential parties. This incentive is likely to be weaker for the districts represented by an opposition MP (because he/she might reap all the benefits from voters' satisfaction). However, voters' perception that economic policy is shaped by incumbent rather than opposition reduces the possibility of attribution of (temporal) economic policy improvements (or deteriorations) to opposition MPs even

in those districts. Still, if magnitude of political cycles decreases in such districts, then regions with larger number of opposition MPs are expected to exhibit cycles of lower magnitude. (Political cycles may even have an opposite shape there.)

Parliament and regional councils could not effectively resist this pressure for creating political cycles, not only because of lack of sufficient authority, but also due to the fact that none of the councils had a majority formed by opposition. Hence, opposition parties and single candidates were not able to counteract this policy on both national and regional level in any voting district. Although, different degree of capture of regional councils by the "party-in-power" (presence of opposition check) probably influenced the regional differences in the magnitude of cycles.

As to (single candidates') elections to regional councils, again, "party-in-power" is interested in creating cycles to favor its candidates. And it is unlikely that opposition in regional councils could resist this policy or that voters ascribed any positive outcomes to opposition members of regional councils. Still, even if magnitude of political cycle shrinks in the districts represented by opposition members of regional councils, every region as a whole is supposed to demonstrate a political cycle. Again, caution concerning the degree of "party's-in-power" capture of regional councils and corresponding variations in the magnitude of cycles applies.[3]

Our interpretation and methodological approach (incumbent vs. opposition) is very much similar to Mau et al. (2001), which studies electoral behavior in Russia on the basis of 1995-2000 federal elections data from Russian regions.

4 Empirical tests

4.1 Data description

Consumers price index inflation and real GDP growth are tested for the presence of electoral cycles in economic *outcomes* (i.e. indicators of economic activity). Monthly national-level data on CPI, PPI, and

[3]Final remarks supporting our claim on the existence of incentives for creating regional cycles are as follows. It is generally recognized by Ukrainian political scientists that on Parliamentary elections people vote according to their ideological preferences ("after their heart") only for parties' lists, while in single candidate's choice they are guided by pragmatic considerations rather than political preferences (vote "after their brain") — support the candidate who distributed more financial "aid" to voters (although this practice is legally banned). Another important background fact is that elections to local councils attract far less attention of voters than elections to the Parliament.

nominal GDP[4] from the State Committee of Statistics of Ukraine are used. Real GDP is deflated by PPI, and January 2000 is taken as a base level.

However, this investigation emphasizes testing for electoral cycles in economic (particularly, fiscal) *policy measures*. We investigate the data of State and regional budgets. Data on budgets execution, rather than planned budgets, are used because actual flaws of budget incomes and expenditures differ from planned ones (especially in the short-run). State and regional budgets execution reports are taken from the Treasury office.

Only Parliamentary (March 1998 and March 2002 in the period of interest), Presidential (October 1999), and regional councils elections (which were conducted simultaneously with Parliamentary elections, in March 1998 and March 2002) are considered.[5] Thus, we are looking for opportunistic cycles in 1998:M3, 1999:M10, and 2002:M3.[6]

4.2 Model specification

For econometric testing we use aggregated national-level monthly data on GDP growth and CPI inflation during 1996-2002, and monthly panel data of regional budgets execution in 27 Ukrainian regions during 1998-2001 period.

The specification suggested for testing Hypothesis A about the presence of electoral cycle is autoregressive model augmented with elections variable:

$$y_{i,t} = \alpha_0 + \alpha_i + \alpha_s + \sum_{j=1}^{k} \beta_j y_{i,t-j} + \sum_{j=-l}^{m} \gamma_j e_{t+j} + \delta t + \varepsilon_{i,t} \qquad (1)$$

where:

$y_{i,t}$ — economic variable (total budget expenditures, social expenditures, share of social expenditures, healthcare expenditures (in levels and as a share), expenditures on agriculture (in levels and as a share), expenditures on industry (in levels and as a share), total revenues, tax

[4] Although monthly GDP series is based on rather limited preliminary statistical data and Committee's expert estimates, these are the official conventionally used data.

[5] It is noteworthy that because of a relatively short time series, seasonal and electoral effects are blended in our sample, and discrimination between them is driven by several, possibly non-representative observations at hand.

[6] This aspect dramatically contrasts Russian case, where elections of regional governors, which are conducted at different time periods independently in each subject of federation, are investigated (see Akhmedov and Zhuravskaya, 2003).

revenues (in levels and as a share), expenditures to revenues ratio, GDP growth etc.),

α_0 — constant term,

α_i — fixed regional effect,

α_s — fixed time effect (seasonal dummy),

β_j — coefficients for autoregressive terms,

γ_j — coefficients reflecting pre-(post-)elections period effect on economic variable,

e_t — dummy variable, which equals 1 at the month of elections, and 0 otherwise,

δ — trend coefficient (for trend-stationary variables),

$\varepsilon_{i,t}$ — disturbance term.

Obviously, for aggregated national-level series equation 1 reduces to: $y_t = \alpha_0 + \alpha_s + \sum_{j=1}^{k} \beta_j y_{t-j} + \sum_{j=-l}^{m} \gamma_j e_{t+j} + \delta t + \varepsilon_t$.

Hypothesis A predicts a U- or refersed U-shaped pattern (depending on the nature of respective indicator) formed by γ_j.

Hypothesis B about the determinants for the magnitude of electoral cycle will be tested in related to previous technique, using:[7]

$$\frac{\sum_{j=-l}^{m}(\widehat{\gamma}_j + \widehat{\gamma}_{j,i} + \widehat{\gamma}_{j,t})e_{t+j}}{\sum_{j=-l}^{m} \widehat{y}_{i,t+j}} = \alpha_0 + \alpha_i + \beta x_{i,t} + \varepsilon_{i,t} \qquad (2)$$

where:

$t = \{1998 : M3, 1999 : M10, 2002 : M3\}$,

$x_{i,t}$ — proxy variable for sophistication of voters and easiness of access to information (e.g. share of population with higher education, share of urban population, number of computers per capita, number of newspapers registered per capita),

β — coefficient capturing the influence of voters' rationality and information accessibility,

$\widehat{\gamma}_{j,i}$ — estimated coefficients reflecting regional (preferably random, rather than fixed) pre-(post-) elections period effect on economic variable,

$\widehat{\gamma}_{j,t}$ — estimated coefficients reflecting time (preferably random, rather than fixed) pre-(post-) elections period effect on economic variable,

$\widehat{y}_{i,t+j}$ — fitted value from ARIMA model of $y_{i,t}$.

It is easy to see that numerator on the left-hand sife of equation 2 measures the absolute magnitude of electoral cycle, and fitted values

[7] A more radical approach would be to attribute any divergence from trend to opportunistic cycles by using instead: $\frac{\sum_{j=-l}^{m}(y_{i,t+j} - \widehat{y}_{i,t+j})}{\sum_{j=-l}^{m} \widehat{y}_{i,t+j}} = \alpha_0 + \alpha_i + \beta x_{i,t} + \varepsilon_{i,t}$ However, we need a very accurate estimate $\widehat{y}_{i,t}$ to make it feasible. Excercises with this method did not give any reasonable results, meaning that there is too much noise in the data.

from ARIMA model in denominator scale the absolute level, thus providing a (comparable) quantification of the relative magnitude of electoral cycle.

Hypothesis B predicts a negative sign for β. Presence of individual constant coefficients α_i (i.e. variation in the magnitude of political cycles) is interpreted as a result of different density of opposition MPs and various degree of regional councils' capture by the "party-in-power" in these regions, as long as we control for rationality of voters and easiness of access to information there.

4.3 Preliminary estimation results

4.3.1 National-level data tests for electoral cycles

At first we have tested for the presence of electoral cycles in the national-level economic outcomes and policy measures. PcGive package (Hendry and Doornik, 2001) is used for estimation of time-series models. Appendix A presents estimation results for CPI inflation, GDP growth, State budget's expenditures, revenues and deficit; and appendix B depicts estimated cycles in these variables (all series pictured are de-trended and seasonally adjusted).

CPI inflation demonstrates lower paces half a year before elections as compared to the same period after elections, a dramatic downturn 1 month before elections, and rises sharply 1 month after elections. GDP growth shows an upturn 2 months before elections and in the month of elections, as well as 1 month afterwards. Budget expenditures demonstrate an upturn before and a downturn after elections. Budget revenues are decreasing in a 6 months before to 2 months before elections period, but they rise sharply during the 3-months period around elections. On the contrary, budget revenues including interbudgetary transfers do not demonstrate any decreasing pattern before elections, meaning that the central budget receives net transfers from lower-level budgets 2 months before elections. As a result of electoral cycle, budget deficit is higher in the period before elections, reaching its maximum 2 months before elections. The behavior of a budget deficit including intergovernmental transfers variable reveals that increasing transfers from local budgets to the central budget in the period 2 months before elections are used to balance the central budget's expenditures and revenues.

However, all these regularities are not significant at conventional levels of significance, at least partially due to a little number of observations at hand. Hence, we can conclude that we found only weak evidence of electoral cycles in State budget, GDP growth and inflation (i.e., electoral cycle is observed not only in policy variables, but is also transmitted from government policy measures to economic activity indicators).

4.3.2 Regional-level data tests for electoral cycles

Some estimation details. The model we estimate (equation 1) has the general form of:

$$y_{i,t} = \alpha_i + \sum_{j=1}^{k} \beta_j y_{i,t-j} + \mathbf{x}_t'\boldsymbol{\theta} + \varepsilon_{i,t} \tag{3}$$

The problem with estimating such models is the violation of classical assumption that $\mathrm{E}(\boldsymbol{\epsilon}|\mathbf{X}) = \mathbf{0}$ due to the presence of the lagged dependent variable. The usual way to proceed is as follows (Arellano and Bond, 1991; Greene, 2000). At first individual effects α_i are eliminated by differencing the equation in levels 3:

$$\begin{aligned} y_{i,t} - y_{i,t-1} &= \sum_{j=1}^{k} \beta_j (y_{i,t-j} - y_{i,t-j-1}) + (\mathbf{x}_t - \mathbf{x}_{t-1})'\boldsymbol{\theta} + (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \\ \Delta y_{i,t} &= \sum_{j=1}^{k} \beta_j \Delta y_{i,t-j} + \Delta \mathbf{x}_t'\boldsymbol{\theta} + \Delta\varepsilon_{i,t} \end{aligned} \tag{4}$$

Then the lags of $y_{i,t-1}$ and $\mathbf{x}_{t-1}$ are used as instrumental variables in GMM estimator based on equation in differences 4. However, this estimator is found to have large finite sample bias.

A system GMM estimator is believed to have a better performance (Arellano and Bover, 1995; Blundell and Bond, 1998). It combines both equation in levels and equation in differences. The instruments for the regression in differences are the same as described above. Lagged differences of the corresponding variables, $\Delta y_{i,t-1}$ and $\Delta \mathbf{x}_{t-1}$, are used as instruments for the regression in levels.

Sargan test is used for testing for the validity of instruments, with the null hypothesis that the instruments are not correlated with residuals. Because of the presence of MA disturbance term, first order autocorrelation process arises in the equation in differences. However, proposed estimation method requires the absence of the first order autocorrelation in original equation in levels (equation 3), thus the second order autocorrelation in the transformed equation in differences (equation 4) should be eliminated.

In our particular case, equation in levels is equation 1, and it gives the following equation in differences:

$$y_{i,t} - y_{i,t-1} = (\alpha_s - \alpha_{s-1}) + \sum_{j=1}^{k} \beta_j (y_{i,t-j} - y_{i,t-j-1}) +$$
$$+ \sum_{j=-l}^{m} \gamma_j (e_{t+j} - e_{t+j-1}) + \delta(t - (t-1)) + (\varepsilon_{i,t} - \varepsilon_{i,t-1})$$
$$\Delta y_{i,t} = \Delta\alpha_s + \sum_{j=1}^{k} \beta_j \Delta y_{i,t-j} + \sum_{j=-l}^{m} \gamma_j \Delta e_{t+j} + \delta + \Delta\varepsilon_{i,t}$$

In our case, lags of $y_{i,t-1}$ serve as instrumental variables for equation in differences, and lagged difference $\Delta y_{i,t-1}$ is taken as an instrumental variable for equation in levels.

Estimation results. We use a DPD package for GiveWin (Doornik et al., 2002) for estimation of panel data models. Appendix C presents estimation results for fiscal policy measures from the panel of regional budgets execution data; and appendix D depicts estimated cycles (again, de-trended and seasonally adjusted).

Apparently, many of the spending items demonstrate a distinct electoral cycle. Significant relationships are demonstrated by total budget expenditues, total budget expenditues including intergovernmental transfers, and expenditures on social protection. Thus, total expenditures reach their peak 5 months before elections, and gradually fall afterwards. Note that total expenditures including intergovernmental transfers are higher than previous indicator during the 2-months period right before elections, i.e. regions transfer more funds to the central budget then. Expenditures on education, social protection, media, industry and communications clearly show a patern correlated with elections date. They are typically increasing before elections, reach their maximum near the time of elections, and fall afterwards. Expenditures on health care and agriculture are also rising in the period before elections, but they are demonstrating higher volumes on the average in post-electoral months. Most likely, some intra-budget redistribution between spending items are happening.

Budget revenue items give a less clear-cut picture. Here, only total budget revenues and total budget revenues including intergovernmental transfers have significant interrelation with elections. Total revenues increase in the period before elections in order to finance higher expenditures, as well as transfers to central budget. This increase is explained in part by initially low but then rising non-tax revenues (capital income, rents, fees, custom duties) and revenues from transactions with capital.

However, tax revenues are falling from an initially high level during the period before elections (and rise only afterwards).

Budget deficit is also correlated with elections date. Budget deficit starts to boost as elections approach, and rises until the 2nd month after elections, majority of coefficients on electoral dummies are highly significant.

Thus, we found rather convincing evidence for the presence of electoral cycle in regional fiscal policy.

Budget expenditures tend to rise in pre-electoral period, and fall in post-electoral period. As a result, more funds are spent on public goods and large employers (education and communication sectors), direct monetary transfers (social protection) and political communication and "propaganda" (mass-media). However, there is also redistribution within the budgets between different spending items, for instance expenditures on health care and agriculture are counter-cyclical in a sense: although growing in the period before elections, they are higher in post-electoral phase rather than in pre-electoral one. Budget revenues generally follow the same pattern, but a certain structural change is observed: tax revenues fall throughout the electoral period demonstrating an expansionary electoral cycle, while non-tax revenues and revenues from capital rise during the electoral period compensating for increased spending. Increasing deficit accounts for the remaining discrepancy between budget expenditures and revenues in pre-electoral period.

Hence, rather than relying on intertemporal redistribution (increasing spending, decreasing revenues, and running a deficit, which is liquidated from savings and in subsequent periods) only, incumbent also expands the public sector in order to gain control over higher volumes of resources and redistribute them with an aim of increasing its electoral chances. However, this expansion is somehow selective: tax revenues (that directly hit the majority of voters) decrease in the period of elections, while non-tax revenues (that are less observable by the majority of voters directly) and revenues from transactions with capital (also more relevant to a narrower group of richer voters, e.g. capital owners, rent-seekers, and entrepreneurs) are actually increasing. Additonally, part of the increased expenditures is financed due to intra-budgetary redistribution between spending items.

An additional interesting finding is pre-electoral increase of redistribution via the central budget due to intergovernmental transfers. Perhaps, this can be explained by the tendency towards centralization of political decision making in the critical periods, of which electoral campaign is an example.

4.3.3 Regional-level data tests for the impact of voters' sophistication/access to information

Magnitude of electoral cycles ($\sum_{j=-l}^{m}(\widehat{\gamma}_j + \widehat{\gamma}_{j,i} + \widehat{\gamma}_{j,t})e_{t+j}$) is measured by estimating equation 1 with region-specific and time-specific electoral effects ($\widehat{\gamma}_{j,i}$ and $\widehat{\gamma}_{j,t}$). In order to measure relative magnitudes of electoral cycles, we use the value of respective indicator devoid of electoral movements ($\widehat{y}_{i,t}$) as a scale factor. It is estimated in the following way (using ARIMA(2,0,0)):

$$y_{i,t} = \alpha_0 + \alpha_i + \alpha_s + \beta_1 y_{i,t-1} + \beta_2 y_{i,t-2} + \delta t + \varepsilon_{i,t}$$

$$\widehat{y}_{i,t} = \widehat{\alpha}_0 + \widehat{\alpha}_i + \widehat{\alpha}_s + \widehat{\beta}_1 \widehat{y}_{i,t-1} + \widehat{\beta}_2 \widehat{y}_{i,t-2} + \widehat{\delta} t$$

Finally, we can estimate equation 2 using share of urban population, as well as volumes of TV and radio broadcasting as proxies for sophistication of voters and easiness of their access to information. Estimation results are presented in appendix E (note that each equation is estimated with and without fixed regional effects).

As it can be seen from pooled refressions, share of urban population has a significant and negative effect on the magnitude of cycles in budget revenues and deficit (in panel regressions its coefficient is negative albeit insignificant). There seem to be at most weak effect of TV penetration on the magnitude of cycles — its coefficient is significant in only one regression for budget expenditures, where it has a negative sign. Volume of radio broadcasts seem to have a significant impact on the magnitude of cycles in budget expenditures. However, it has a positive influence, which contradicts theoretical predictions. One possible explanation may be that radio not only fails to provide voters with a useful political information, but is used in some regions (most likely, those with less informed/sophisticated population), along with economic policy cycles, to manipulate voters.

Perhaps, this is explained by the fact that radio does not appear to be an efficient information source, i.e. that it is more politically biased (or vice versa, less involved in political discourse) than television.

5 Conclusions

We have found relatively strong empirical proofs for the existence of electoral cycles in the behavior of fiscal policy instruments in Ukraine. This is especially noticeable in total budget expenditures and revenues, as well as deficit. Some weak evidence of a similar pattern are also observed in the behavior of measures of economic activity such as CPI inflation and GDP growth. There are some weak evidence that regions

with more informed or sophisticated voters (as measured by the share of urban population and volumes of TV broadcating) demonostrate lower magnitudes of electoral cycles. The existence of fiscal PBC in Ukraine is broadly consistent with the findings of Akhmedov and Zhuravskaya (2003) for Russia, and Hallerberg and de Souza (2000) for Eastern European accession countries.

Since magnitude of electoral cycles shrinks when voters become more informed and sophisticated, education of voters and promotion of analysis and information dissemination about governmental policy, especially on the eve of elections, will reduce the scope of distorting opportunistic cycles. At the same time, restricting opportunistic cyclic behavior of incumbent may not be an improvement because we can not rule out the case that electoral cycles convey useful information about government's competence.

A Estimation results, time-series models

Table 3: Estimation results

REGRESSORS	CPIinfl	dGDP_1_2000	le70total^t	le70totaligt^t
α_0	0.394019	1862.93*	1.67703*	1.40135
	0.5534	941.0	0.9234	0.8645
$y_{i,t-1}$	0.599363***	-0.671216***	0.339369	0.385077
	0.1137	0.1453	0.2306	0.2299
$y_{i,t-2}$	-	-0.294898**	0.184622	0.209708
		0.1418	0.2204	0.2203
$y_{i,t-4}$	-	-0.0942638	-	-
		0.1551		
$y_{i,t-5}$	-	-0.125841	-	-
		0.1608		
$y_{i,t-6}$	0.162405	-0.171374	-	-
	0.1075	0.1329		
e_{t+6}	-0.606113	-931.038	0.0352283	0.0225367
	0.8247	1440.	0.1270	0.1253
e_{t+5}	-0.324274	541.680	0.0393695	0.0481306
	0.7261	1245.	0.1117	0.1102
e_{t+4}	-0.419162	545.119	0.0522521	0.0349725
	0.7275	1229.	0.1117	0.1107
e_{t+3}	-0.137982	-1905.47	0.0477046	0.0281257
	0.7301	1231.	0.1125	0.1110
e_{t+2}	0.0773132	-202.766	0.0120567	-0.00247730
	0.7276	1273.	0.1578	0.1569
e_{t+1}	-0.964615	603.408	0.104176	0.0476274
	0.7545	1300.	0.1694	0.1683
e_t	-0.0812608	60.8888	0.0823565	0.0628974
	0.7419	1258.	0.1210	0.1178
e_{t-1}	1.11140	220.640	-0.0900002	-0.118268
	0.7569	1341.	0.1225	0.1195
e_{t-2}	-0.367098	-1864.42	-0.128017	-0.0988164
	0.7333	1267.	0.1209	0.1196
e_{t-3}	0.0637307	172.206	0.0820524	0.0914099
	0.7289	1258.	0.1162	0.1150
e_{t-4}	0.824389	1167.78	0.0503220	0.0483854
	0.7331	1251.	0.1171	0.1160
e_{t-5}	0.309770	815.663	-0.152040	-0.130877
	0.7535	1241.	0.1145	0.1135
e_{t-6}	0.0951923	-1701.93	0.0669419	0.0687315
	0.8185	1442.	0.1348	0.1324
# obs.	72	72	46	46
R^2	0.679947	0.692409	0.874397	0.865522
AR(1) test	10.402	11.355	8.5098*	7.3628
# lags	12	12	4	4

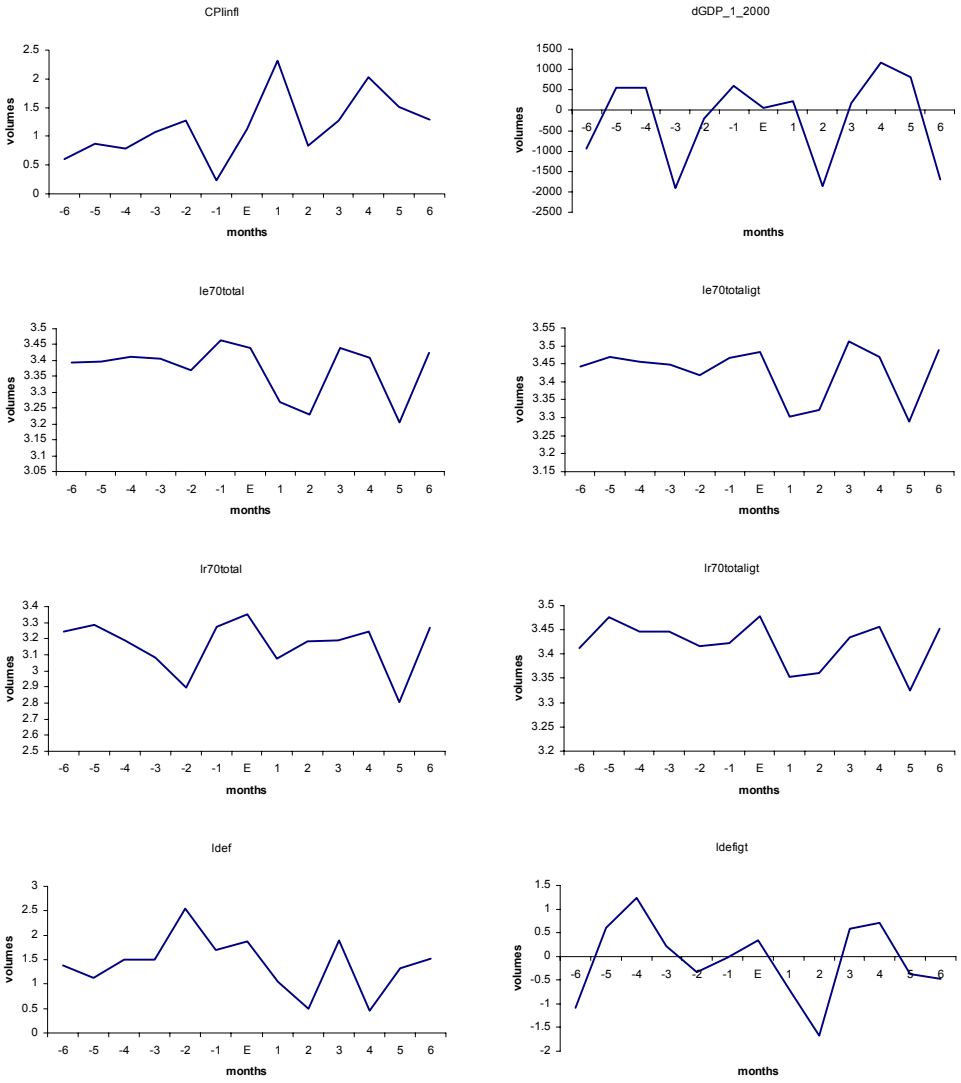
Notes: Estimated by OLS. Monthly dummies are included but not reported. Standard errors in parentheses. ^{t} — trend is included (but not reported). *, **, *** — significant at the 10%, 5%, and 1% confidence level, respectively.

Table 4: Estimation results

REGRESSORS	lr70total^t	lr70totaligt^t	ldef^t	ldefigt^t
α_0	1.59240*	1.90569*	0.256308	-0.0659420
	0.7890	0.9560	0.4481	0.8451
$y_{i,t-1}$	0.324093	0.314920	0.471580*	-0.129452
	0.2213	0.2347	0.2277	0.2255
$y_{i,t-2}$	0.261119	0.141985	-0.209752	0.0952223
	0.1873	0.2306	0.2274	0.2593
e_{t+6}	0.0450057	-0.0147123	0.119896	-0.844829
	0.1352	0.1446	0.4792	1.046
e_{t+5}	0.0898522	0.0479315	-0.139701	0.834772
	0.1205	0.1265	0.4164	0.8217
e_{t+4}	-0.00401917	0.0182261	0.240303	1.48190*
	0.1214	0.1271	0.4165	0.8544
e_{t+3}	-0.114473	0.0188589	0.237133	0.452894
	0.1210	0.1270	0.4193	0.9022
e_{t+2}	-0.299207*	-0.0115569	1.28567**	-0.0876126
	0.1685	0.1816	0.5999	1.173
e_{t+1}	0.0793358	-0.00430896	0.434243	0.216367
	0.1966	0.1943	0.7032	1.246
e_t	0.155148	0.0499280	0.608993	0.576626
	0.1223	0.1331	0.4860	0.8773
e_{t-1}	-0.121336	-0.0740954	-0.224359	-0.443606
	0.1304	0.1367	0.4774	0.8896
e_{t-2}	-0.0112558	-0.0675185	-0.763274	-1.43829
	0.1323	0.1322	0.4625	0.8342
e_{t-3}	-0.00755538	0.00780586	0.638225	0.817372
	0.1221	0.1313	0.4758	0.8909
e_{t-4}	0.0468704	0.0295855	-0.799886	0.951734
	0.1217	0.1312	0.4869	0.9153
e_{t-5}	-0.393302***	-0.102978	0.0618082	-0.141015
	0.1232	0.1316	0.4563	0.8667
e_{t-6}	0.0690950	0.0238506	0.260350	-0.236842
	0.1685	0.1503	0.4821	0.9374
# obs.	46	46	46	46
R^2	0.845339	0.746856	0.858097	0.701762
AR(1) test	8.3274*	5.9726	11.503**	10.202**
# lags	4	4	4	4

Notes: Estimated by OLS. Monthly dummies are included but not reported. Standard errors in parentheses. ^{t} — trend is included (but not reported). *, **, *** — significant at the 10%, 5%, and 1% confidence level, respectively.

B Estimated cycles, time-series models



C Estimation results, dynamic panel data models

Table 5: Estimation results

REGRESSORS	le70total	le70totaligt	le7educ	le8health
δ	-5.75868	10.0732***	4.76503**	8.37373***
	3.781	2.288	1.850	2.381
$y_{i,t-1}$	3.70367***	-1.80032***	-1.32085***	-2.09117***
	1.276	0.5094	0.4856	0.5741
$y_{i,t-2}$	3.18859***	-1.36126***	0.0588577	-0.590319
	1.058	0.4593	0.5474	0.3744
e_{t+6}	13.8364***	0.526477**	-0.304811	-0.293139
	3.883	0.2279	0.4598	0.5591
e_{t+5}	34.2036***	1.41786**	0.229303	-1.49396
	9.648	0.5983	0.5778	1.256
e_{t+4}	31.2315***	3.02282***	1.02841	-2.25011
	8.746	0.8798	0.6982	1.648
e_{t+3}	25.7212***	5.45535***	1.07495	-2.80127
	7.067	1.422	1.001	1.889
e_{t+2}	10.2754***	6.23592***	1.18625	-2.46205
	2.637	1.577	0.7499	1.688
e_{t+1}	-3.94389**	5.11199***	0.509978	-1.70407
	1.585	1.264	0.9776	1.620
e_t	-17.2899***	3.09532***	-0.381362	-0.128633
	5.185	0.7582	1.238	1.771
e_{t-1}	-24.637***	4.28242***	-0.442813	-0.351201
	7.299	1.136	1.097	1.231
e_{t-2}	-27.9289***	5.69211***	-1.14966	-0.632600
	8.234	1.577	0.9867	1.172
e_{t-3}	-31.6977***	6.26385***	-1.06481	-1.05205
	9.306	1.763	0.7578	0.9619
e_{t-4}	-35.4296***	4.22078***	-1.05386*	-1.53520***
	10.23	1.255	0.5936	0.5606
e_{t-5}	-31.0793***	2.63810***	-0.385222	-1.40118***
	8.885	0.8534	0.3908	0.4130
e_{t-6}	-17.8524***	1.12819***	-0.247299	-0.297517*
	5.125	0.3845	0.3412	0.1651
# obs.	1242	1242	1242	1242
Wald (joint)	68.30***	63.42***	51.73***	37.01***
Wald (dummy)	400.0***	547.1***	533.9***	302.5***
Sargan test,	6.849e-012	-8.007e-014	-7.626e-016	7.104e-015
df	1111	1111	1111	1111
AR(1) test	2.890***	2.731***	0.04472	1.692*
AR(2) test	2.979***	1.604	-2.076**	-2.324**

Notes: System GMM estimator uses as instruments lags of $y_{i,t-1}$ for equation in differences, and lagged difference $\Delta y_{i,t-1}$ for equation in levels. Second step estimation results are presented. Monthly dummies are included but not reported. Standard errors in parentheses.

*, **, *** — significant at the 10%, 5%, and 1% confidence level, respectively.

Table 6: Estimation results

REGRESSORS	le9socialpr	le12media	le14industry	le16agric
δ	13.6387**	-10.1252	-1.33832	-6.37881
	5.342	8.797	5.341	20.77
$y_{i,t-1}$	-2.52102***	0.426459	0.382735	-0.675896
	0.8479	0.9531	1.238	2.488
$y_{i,t-2}$	-0.320627	-1.64533	-0.141974	-1.45267
	0.2438	2.336	0.8279	2.181
e_{t+6}	2.55275**	0.926592	-6.80382	-2.62260
	0.9991	1.159	8.210	3.194
e_{t+5}	1.69917	1.86039	14.1235	-5.79838
	1.261	2.797	29.47	4.021
e_{t+4}	4.97365**	3.05169	75.7819	-9.50936
	2.123	3.514	84.33	17.65
e_{t+3}	11.7709***	2.80699	108.943	-8.55370
	4.043	4.017	117.5	11.20
e_{t+2}	15.7357***	4.76893	119.487	-1.94475
	5.766	7.512	120.1	18.38
e_{t+1}	15.4655***	6.66324	64.6425	1.66836
	5.361	10.11	63.40	43.93
e_t	1.01871	7.75285	5.70401	3.16009
	2.851	10.52	20.64	47.09
e_{t-1}	-6.26087	9.49327	-11.4072	9.72731
	3.824	9.871	14.84	67.38
e_{t-2}	-9.63836*	7.74587	-22.2622	14.1049
	5.484	8.123	18.03	86.74
e_{t-3}	-8.40054*	6.12726	11.6018	15.2284
	5.060	6.441	26.78	86.73
e_{t-4}	-4.17634	3.40800	35.5861	9.30930
	3.741	4.399	41.97	51.22
e_{t-5}	-1.37785	1.96956	48.5328	5.57190
	2.780	3.635	49.51	30.24
e_{t-6}	-1.57361	1.14885	29.0320	1.05215
	1.749	1.695	25.75	9.435
# obs.	1242	1242	1170	1242
Wald (joint)	43.47***	21.35	11.58	24.83*
Wald (dummy)	81.79***	127.4***	11.02	20.13*
Sargan test,	-3.591e-014	-4.316e-015	1.168e-013	-3.797e-015
df	1111	1111	1111	1111
AR(1) test	1.974**	-0.7106	1.024	0.2496
AR(2) test	1.624	0.6481	0.9907	0.2210

Notes: System GMM estimator uses as instruments lags of $y_{i,t-1}$ for equation in differences, and lagged difference $\Delta y_{i,t-1}$ for equation in levels. Second step estimation results are presented. Monthly dummies are included but not reported. Standard errors in parentheses.

*, **, *** — significant at the 10%, 5%, and 1% confidence level, respectively.

Table 7: Estimation results

REGRESSORS	le17communic	lr70total	lr70totaligt	lr10tax
δ	-3.48636	-20.9092*	-9.38004	2.20332
	6.235	11.48	7.196	5.832
$y_{i,t-1}$	-0.368995	0.0519669	-6.34061***	-0.619299
	0.5025	0.4322	2.069	0.9277
$y_{i,t-2}$	-0.310303	-2.68710**	4.77371**	0.897410
	0.7397	1.175	2.210	1.530
e_{t+6}	-0.0342014	2.85371**	3.49938***	0.860249***
	0.7694	1.181	1.346	0.2581
e_{t+5}	4.41983	17.7448**	14.7486**	0.987577***
	8.413	7.695	5.892	0.2444
e_{t+4}	7.41918	37.6832**	14.9819**	1.18778***
	13.29	16.51	5.859	0.2953
e_{t+3}	9.41547	57.3875**	19.6567***	0.474377
	15.63	25.23	7.418	1.137
e_{t+2}	4.64329	63.7338**	20.7841***	-0.432876
	8.244	28.12	7.957	1.572
e_{t+1}	-0.115400	65.8800**	18.8654**	-0.112892
	1.820	28.97	7.508	0.9183
e_t	-0.351573	56.0999**	37.6048**	0.647491
	8.063	24.54	15.27	0.5649
e_{t-1}	-1.60276	49.0893**	48.7854**	0.129835
	5.719	21.44	19.11	1.419
e_{t-2}	1.64369	55.3436**	38.7040***	0.0769365
	7.464	24.22	14.65	1.606
e_{t-3}	2.14164	55.3361**	33.0614***	0.0378376
	10.03	24.15	12.10	1.878
e_{t-4}	2.91581	45.4590**	20.3794***	-0.348233
	11.57	19.87	6.901	2.204
e_{t-5}	1.20470	27.5252**	17.9170***	-2.55151
	10.79	12.44	6.234	3.093
e_{t-6}	-0.0468471	13.1577**	4.24588***	-1.59627
	6.191	6.202	1.267	0.9941
# obs.	1242	1242	1242	1242
Wald (joint)	18.37	97.98***	43.47***	76.46***
Wald (dummy)	14.91	877.0***	332.8***	465.5***
Sargan test,	9.212e-015	-5.979e-012	2.100e-012	8.156e-015
df	1111	1111	1111	1111
AR(1) test	0.7675	2.099**	5.202***	-0.3926
AR(2) test	1.080	2.079**	1.817*	-2.138**

Notes: System GMM estimator uses as instruments lags of $y_{i,t-1}$ for equation in differences, and lagged difference $\Delta y_{i,t-1}$ for equation in levels. Second step estimation results are presented. Monthly dummies are included but not reported. Standard errors in parentheses.

*, **, *** — significant at the 10%, 5%, and 1% confidence level, respectively.

Table 8: Estimation results

REGRESSORS	lr20nontax	lr30capital	lr50funds	ldef
δ	-0.0577239	-23.6678	5.57971	-65.5530**
	4.654	33.49	16.36	31.46
$y_{i,t-1}$	-0.791880	-1.08902	-1.75670	6.20548*
	2.928	1.409	2.041	3.278
$y_{i,t-2}$	-0.484286	-1.81510	-0.803569	7.67123**
	2.677	1.439	1.519	3.759
e_{t+6}	-0.895277	1.64588	-3.65584	10.6739**
	1.286	10.39	7.923	4.544
e_{t+5}	-1.11079	10.7466	-6.26833	0.922499
	2.602	15.26	13.96	3.167
e_{t+4}	-1.22065	19.9760	-4.09279	-3.02739
	3.632	34.81	9.193	4.699
e_{t+3}	-0.749172	22.6323	-1.55595	-8.75209
	3.888	45.96	5.688	6.161
e_{t+2}	0.0671312	34.9159	-0.522003	3.72107
	10.87	40.24	15.05	4.587
e_{t+1}	0.752558	20.9700	-6.32792	47.3365**
	13.94	31.76	47.19	21.15
e_t	0.844735	35.0014	-5.45859	65.7329**
	11.58	52.64	58.80	29.21
e_{t-1}	1.76394	31.6709	-6.32614	95.1414**
	12.72	76.96	59.36	42.17
e_{t-2}	1.76833	44.2577	-12.2378	108.325**
	11.78	114.8	65.18	48.69
e_{t-3}	0.989251	45.8136	-11.3642	108.391**
	9.218	110.9	39.91	49.27
e_{t-4}	2.00077	26.3252	-8.24597	92.8721**
	8.053	72.44	18.06	42.63
e_{t-5}	2.20657	20.8028	-3.73312	58.7175**
	3.720	42.71	6.235	26.52
e_{t-6}	1.57691	2.32373	-3.02992	21.3794**
	2.714	11.13	4.248	9.534
# obs.	1242	1042	1242	1242
Wald (joint)	24.00*	13.91	9.021	18.71
Wald (dummy)	38.60***	12.10	10.34	29.29***
Sargan test,	1.978e-015	-3.489e-016	2.610e-015	3.895e-014
df	1111	929	1111	1111
AR(1) test	0.2148	0.1929	1.182	2.103**
AR(2) test	0.07146	0.4158	0.001393	.NaN

Notes: System GMM estimator uses as instruments lags of $y_{i,t-1}$ for equation in differences, and lagged difference $\Delta y_{i,t-1}$ for equation in levels. Second step estimation results are presented. Monthly dummies are included but not reported. Standard errors in parentheses.

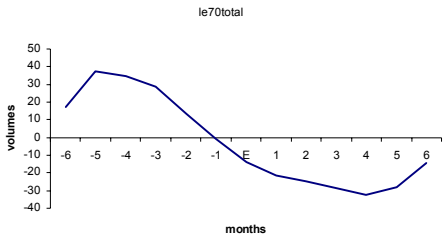
*, **, *** — significant at the 10%, 5%, and 1% confidence level, respectively.

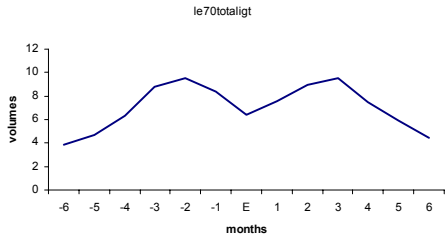
Table 9: Estimation results

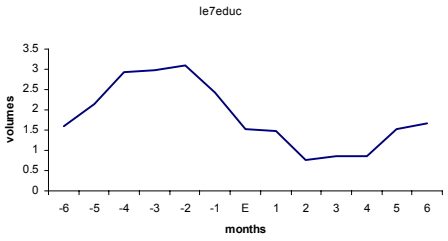
REGRESSORS	ldefigt
δ	-49.1962
	233.4
$y_{i,t-1}$	-0.970884
	3.561
$y_{i,t-2}$	-2.59282
	7.601
e_{t+6}	43.7036
	256.8
e_{t+5}	28.6977
	175.5
e_{t+4}	3.14254
	41.58
e_{t+3}	24.8110
	123.2
e_{t+2}	77.1784
	375.4
e_{t+1}	125.686
	644.6
e_t	69.8823
	356.3
e_{t-1}	-50.5548
	261.3
e_{t-2}	-29.6396
	154.4
e_{t-3}	10.6122
	96.02
e_{t-4}	107.403
	483.1
e_{t-5}	71.8033
	336.3
e_{t-6}	44.2900
	213.9
# obs.	1242
Wald (joint)	16.48
Wald (dummy)	3.966
Sargan test,	3.260e-014
df	1111
AR(1) test	-0.1707
AR(2) test	-0.2129

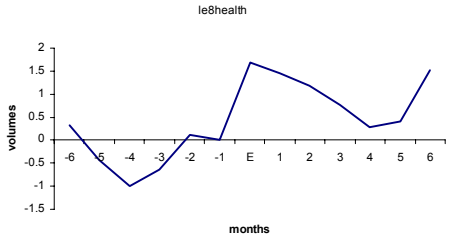
Notes: System GMM estimator uses as instruments lags of $y_{i,t-1}$ for equation in differences, and lagged difference $\Delta y_{i,t-1}$ for equation in levels. Second step estimation results are presented. Monthly dummies are included but not reported. Standard errors in parentheses.
*, **, *** — significant at the 10%, 5%, and 1% confidence level, respectively.

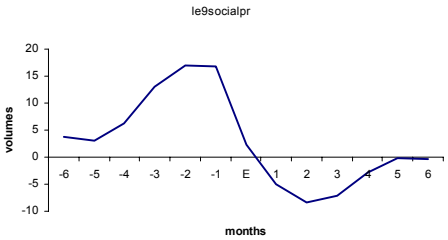
D Estimated cycles, dynamic panel data models

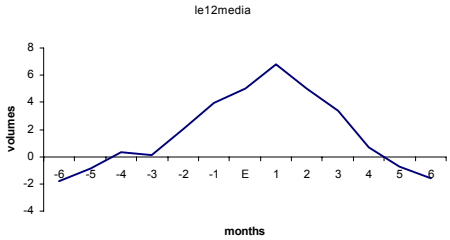


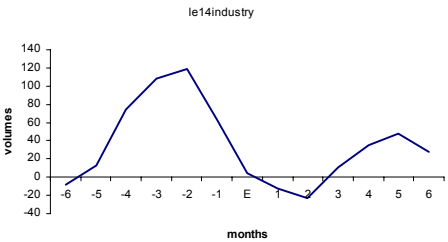


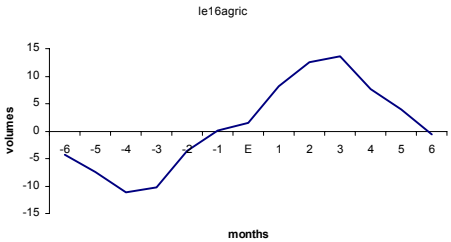


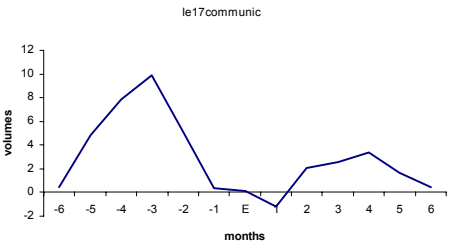


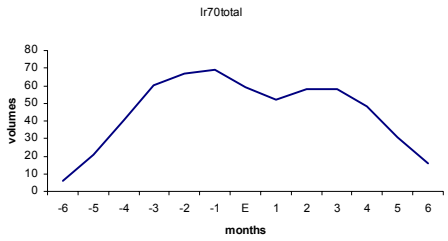








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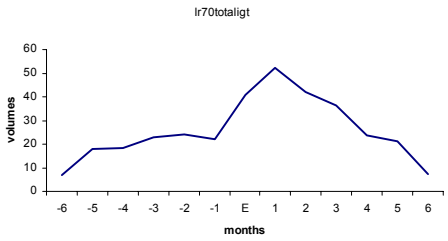
volumes
months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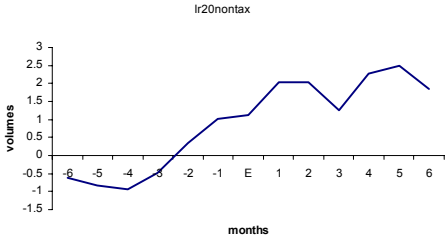
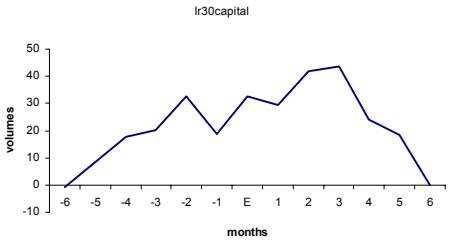
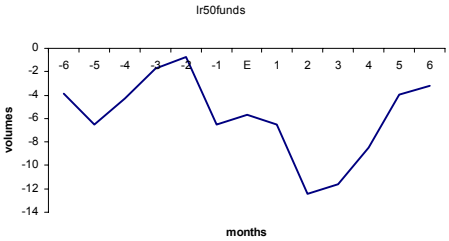
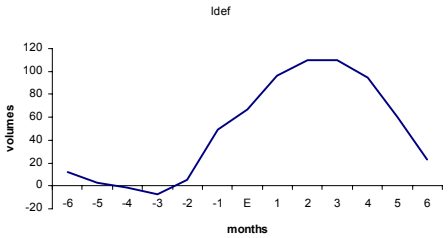
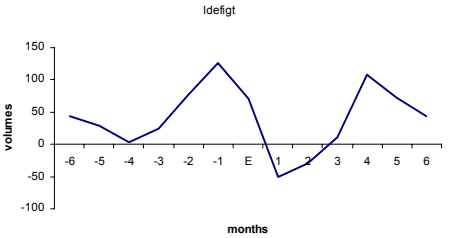
lr10tax
volumes
months


lr20nontax
volumes
months


lr30capital
volumes
months


lr50funds
volumes
months


ldef
volumes
months


ldefigt
volumes
months

E Estimation results, static panel data models

Table 10: Estimation results

REGRESSORS	magcyc_le70^i	magcyc_lr70^i	magcyc_ldef^i
α_0	1.05348	0.104097	8.73207
	1.234	0.2704	14.44
1999 dummy	0.144169***	0.0260855***	0.123100**
	0.003176	0.001113	0.04876
shareurban	-1.72458	-0.210883	-13.9879
	1.968	0.4317	23.05
R^2	0.9879302	0.9644911	0.5757072
	magcyc_le70	magcyc_lr70	magcyc_ldef
α_0	-0.0257941***	-0.0265733***	0.170110*
	0.005876	0.001435	0.08851
1999 dummy	0.143206***	0.0259703***	0.115466***
	0.003101	0.0009723	0.03803
shareurban	0.00679613	-0.00390432*	-0.270681*
	0.009034	0.002094	0.1439
R^2	-0.0257941	0.9438089	0.2314986

Notes: Number of observations is 54 for each equation. Estimated by OLS. Standard errors in parentheses.
^{i} — individual fixed effects are included (but not reported).
*, **, *** — significant at the 10%, 5%, and 1% confidence level, respectively.

Table 11: Estimation results

REGRESSORS	magcyc_le70^i	magcyc_lr70^i	magcyc_ldef^i
α_0	-0.00590338	-0.0283808***	0.0342211
	0.008357	0.003645	0.06423
1999 dummy	0.145926***	0.0259343***	0.124225**
	0.003615	0.001211	0.04599
tv	-0.00267719**	3.32969e-005	-0.00877934
	0.001107	0.0004637	0.009623
R^2	0.9891774	0.9643854	0.5755494
	magcyc_le70	magcyc_lr70	magcyc_ldef
α_0	-0.0218739***	-0.0289877***	0.0167176
	0.002282	0.0006725	0.02267
1999 dummy	0.143153***	0.0259761***	0.117971***
	0.003204	0.001019	0.04062
tv	5.55121e-005	-7.87296e-006	-0.00261676
	0.0003092	8.258e-005	0.003331
R^2	0.9750534	0.9415697	0.1548121

Notes: Number of observations is 54 for each equation. Estimated by OLS. Standard errors in parentheses.
^{i} — individual fixed effects are included (but not reported).
*, **, *** — significant at the 10%, 5%, and 1% confidence level, respectively.

Table 12: Estimation results

REGRESSORS	magcyc_le70^i	magcyc_lr70^i	magcyc_ldef^i
α_0	-0.0329014***	-0.0300299***	-0.0242381
	0.001297	0.0008775	0.01508
1999 dummy	0.140230***	0.0248677***	0.122780**
	0.003298	0.0009561	0.04550
radio	0.000874287***	0.000322931**	-0.00219085
	0.0002035	0.0001250	0.003057
R^2	0.9893794	0.9712114	0.5742863
	magcyc_le70	magcyc_lr70	magcyc_ldef
α_0	-0.0228533***	-0.0289379***	0.00669324
	0.0006381	0.0005862	0.006691
1999 dummy	0.142660***	0.0260099***	0.118425***
	0.003119	0.0009922	0.04001
radio	0.000161335***	-1.22680e-005	-0.000912659
	4.260e-005	9.735e-006	0.0007606
R^2	0.976145	0.9417481	0.1545229

Notes: Number of observations is 54 for each equation. Estimated by OLS. Standard errors in parentheses.
^{i} — individual fixed effects are included (but not reported).
*, **, *** — significant at the 10%, 5%, and 1% confidence level, respectively.

F Description of variables

Table 13: Description of budgetary variables

VARIABLE	DESCRIPTION
le7educ	Education
le8health	Health care
le9socialpr	Social protection and social care
le12media	Mass media
le14industry	Industry and power
le16agric	Agriculture, forestry, fishery and hunting
le17communic	Transportation, roads, communications, and IT
le70total	Total Expenditures (excluding spending on intergovernmental transfers)
le70totaligt	Total Expenditures (including spending on intergovernmental transfers)
lr10tax	Tax revenues
lr20nontax	Non-tax revenues
lr30capital	Revenues from transactions with capital
lr50funds	State Targeted Funds
lr70total	Total Revenues (excluding receipts from intergovernmental transfers)
lr70totaligt	Total Revenues (including receipts from intergovernmental transfers)
ldef	Budget deficit
ldefigt	Budget deficit (including intergovernmental transfers)

Note: All budgetary variables are measured in January 2000 prices, in per capita terms, and logarithms are taken.

Table 14: Description of other variables

VARIABLE	DESCRIPTION
CPIinfl	CPI inflation
dGDP_1_2000	Difference of real GDP (in January 2000 prices)
elect	Elections dummy, equals 1 in the month of elections
electminus6	Elections dummy, equals 1 in 6 months before elections
shareurban	Share of urban population in the region
tv	Daily local TV broadcasts by state companies, hours (previous year)
radio	Daily local radio broadcasts by state companies, hours (previous year)
magcyc_le70	Estimated magnitude of electoral cycle in total expenditures
magcyc_lr70	Estimated magnitude of electoral cycle in total revenues
magcyc_ldef	Estimated magnitude of electoral cycle in deficit

Table 15: Descriptive statistics for panel budgetary variables

VARIABLE	TIME SER.	CR. SEC.	# OBS.	MAX	MEAN	MIN	ST. D.
le7educ	1998:1-2001:12	27	1296	3.5047	1.9112	0.0000	0.3935
le8health	1998:1-2001:12	27	1296	4.5863	1.8141	-0.6351	0.3859
le9socialpr	1998:1-2001:12	27	1296	3.5324	1.2742	-3.9046	0.7082
le12media	1998:1-2001:12	27	1296	0.3381	-2.7229	-6.5552	0.8884
le14industry	1998:1-2001:12	27	1260	3.1078	-0.9268	-9.8630	1.8488
le16agric	1998:1-2001:12	27	1296	3.1071	-1.6249	-8.9077	1.5765
le17communic	1998:1-2001:12	27	1296	3.6351	0.4517	-5.6876	0.9122
le70total	1998:1-2001:12	27	1296	5.0744	3.2769	2.0858	0.3849
le70totaligt	1998:1-2001:12	27	1296	5.0823	3.2986	2.0858	0.4213
lr10tax	1998:1-2001:12	27	1296	5.0660	2.7255	-1.5304	0.6528
lr20nontax	1998:1-2001:12	27	1296	2.9996	0.2712	-4.8175	0.8023
lr30capital	1998:1-2001:12	27	1142	1.8529	-2.3025	-10.6118	2.5139
lr50funds	1998:1-2001:12	27	1296	3.6173	-0.2127	-6.6099	1.3801
lr70total	1998:1-2001:12	27	1296	5.0723	2.9179	-0.9391	0.6092
lr70totaligt	1998:1-2001:12	27	1296	5.0812	3.3025	1.9030	0.4062
ldef	1998:1-2001:12	27	1296	4.5586	1.4676	-4.6284	1.2441
ldefigt	1998:1-2001:12	27	1296	3.7559	0.0868	-5.8133	0.9952

Table 16: Descriptive statistics for other variables

VARIABLE	TIME SER.	CR. SEC.	# OBS.	MAX	MEAN	MIN	ST. D.
CPIinfl	1997:1-2002:12	1	72	6.2000	1.0403	-1.8000	1.4513
dGDP_1_2000	1997:1-2002:12	1	72	7435.1	24.099	-10589	2407.3
le70total	1998:1-2001:12	1	48	4.1565	3.3583	2.8606	0.22774
le70totaligt	1998:1-2001:12	1	48	4.1702	3.4200	2.9172	0.21875
lr70total	1998:1-2001:12	1	48	3.7813	3.1966	2.3516	0.21924
lr70totaligt	1998:1-2001:12	1	48	4.1399	3.4276	3.0613	0.18480
ldef	1998:1-2001:12	1	48	3.1881	1.2632	-0.14540	0.82149
ldefigt	1998:1-2001:12	1	48	2.0004	-0.23868	-3.6563	1.0737
shareurban	1998-2002	27	135	1.0000	0.6316	0.3706	0.1638
tv	1998-2002	27	108	25.3000	7.8037	0.0000	5.3340
radio	1998-2002	27	108	94.5000	11.3991	1.3000	16.4748

References

[1] Akhmedov, A., and Zhuravskaya, E. 2003. "Opportunistic Political Cycles: Test in a Young Democracy Setting". *CEPR Discussion Paper* 3855, London: Centre for Economic Policy Research.

[2] Asteriou, D., Economides, G., Philippopoulos, A., and Price, S. 2000. "Electoral Uncertainty, Fiscal Policy and Economic Growth: Theory and Evidence From the UK and a Panel of Parliamentary Democracies." *Manuscript.*

[3] Alesina, A., and Roubini, N., with Cohen, G. D. 1997. *Political Cycles And The Macroeconomy.* The MIT Press.

[4] Arellano, M., and Bond, S. 1991. "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *Review of Economics Studies* 58: 277-297.

[5] Arellano, M., and Bover, O. 1995. "Another Look at the Instrumental Variable Estimation of Error-Components Models." *Journal of Econometrics* 68: 29-51.

[6] Block, S., and Vaaler, P. M. 2001. "The Price of Democracy: Sovereign Risk Ratings, Bond Spreads and Political Business Cycles in Developing Countries." *CID Working Paper* 82, Harvard University.

[7] Blundell, R., and Bond, S. 1998. "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models." *Journal of Econometrics* 87: 115-143.

[8] Doornik, J., Arellano, M., and Bond, S. 2002. "Panel Data Estimation Using DPD for Ox." *Manuscript.*

[9] Drazen, A. 2000a. *Political Economy in Macroeconomics.* Princeton, N.J.: Princeton University Press.

[10] Drazen, A. 2000b. "The Political Business cycle After 25 Years." *NBER Macroeconomics Annual*: 75-117.

[11] Drazen, A. 2001. "Laying Low" During Elections: Political Pressure and Monetary Accommodation." *Manuscript.*

[12] Gartner, M. 1994. "Democracy, Elections and Macroeconomic Policy: Two Decades of Progress." *European Journal of Political Economy* 10: 85-109.

[13] Greene, W. 2000. *Econometric Analysis.* — 4th ed. Prentice-Hall, Inc.

[14] Hallerberg, M., and de Souza, L. V. 2000. "The Political Business cycles of EU Accession Countries." *Discussion Paper* 085, Tinbergen Institute.

[15] Hendry, D. F., and Doornik, J. A. 2001. *Empirical Econometric Modelling Using PcGive: Volume I.* — 3rd ed. London: Timberlake Consultants Press.

[16] Hibbs, D. A. 1992. "Partisan Theory After Fifteen Years." *European Journal of Political Economy* 8: 361-373.

[17] Mau, V., Kochetkova, O., Yanovskiy, K., Zhavoronkov, S., and Lomakina, Y. 2001. "Ekonomicheskie Faktory Elektoralnogo Povedeniya i Obshchestvennogo Soznaniya (Opyt Rossii 1995-2000 Godov)." *Institute for Economy in Transition.*

[18] Nordhaus, W. 1975. "The Political Business Cycle." *Review of Economic Studies* 42: 169-90.

[19] Nordhaus, W. 1989. "Alternative Approaches To The Political Business Cycle." *Papers on Economic Activity* 2: 1-49, Brookings Institution.

[20] Persson, T., and Tabellini, G. 2000. *Political Economics: Explaining Economic Policy.* MIT Press.

[21] Price, S. 1997. "Political Business Cycles and Macroeconomic Credibility: A Survey." *Public Choice* 92: 407-427.

[22] Rogoff, K. 1990. "Equilibrium Political Business Cycles." *American Economic Review* 80: 21-36.

[23] Rogoff, K., and Sibert, A. 1988. "Elections and Macroeconomic Policy Cycles." *Review of Economic Studies* LV: 1-16.

[24] Shi, M., and Svensson, J. 2001. "Conditional Political Budget Cycles." *Manuscript.*

[25] Treisman, D., and Gimpelson, V. 2001. "Political Business Cycles and Russian Elections, or The Manipulations of "Chudar"." *British Journal of Political Science* 31: 225-246.